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ABSTRACT

This paper is a report on the types of online delivery applications used in institutions of higher education (IHEs) to develop and implement World Wide Web-based courses. Many IHEs are grappling with ways to implement and manage online instruction by using local personnel and resources, purchasing some components of management, or outsourcing distance education entirely. While each institution will make decisions that meet its unique needs, it is important to know about the range of possibilities available to university administrators today. The major problems confronting IHEs are twofold: the lack of technical skill among faculty members to convert their courses into online formats; and the need to support and manage distance education. The paper provides an overview of popular online educational delivery applications from the following commercial vendors: Blackboard, Collegis, Complete On-Line Teaching Systems (COLTS), Convene, Creator, e-College, e-Education, Embanet, MadDuck Technologies, SocratEase, WBT Systems, and WebCT. Evaluation criteria for online delivery applications are listed. (Author/MES)

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# An Overview of Online Educational Delivery Applications

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**Abstract**: This paper is a report on the types of online delivery applications used in institutions of higher education to develop and implement web-based courses. Many institutions of higher education (IHE) are grappling with ways to implement and manage online instruction by using local personnel and resources, purchasing some components of management, or outsourcing distance education entirely. While each institution will make decisions that meets its unique needs, it is important to know about the range of possibilities available to university administrators today. The major problems confronting IHE's are twofold: (1) the lack of technical skill among faculty members to convert their courses into online formats, and (2) the need to support and manage distance education. This paper provides an overview of the most popular online educational delivery applications.

## Introduction

Web-based instruction (WBI) is a comprehensive set ofÊ instructionalÊ materials available through a browser over the Internet, an intranet, or extranet.Ê WBI can provide content in hypertext, audio, video files, and other multimedia formats, and include such resources as chat, threaded discussion, e-mail, and hyperlinks.ÊÊ Many institutions of higher education (IHE) choose expensive distance education options rather than WBI, although WBI is much less expensive and equally effective.Ê Most educators adopt technology with the following progression:

- Phase 1:Ê An instructor achieves some level of basic computer literacy.
- Phase 2:Ê The instructor uses computers for personal productivity.
- Phase 3:Ê Venturing into instruction, the instructor uses technology to enhance lecture presentation.
- Phase 4:Ê E-mail is used more widely to interact with colleagues and students, along with Internet searches.
- Phase 5:Ê The instructor decides to re-purpose a course as an imitation of the conventional class requiring live, real-time interaction.

The typical faculty member re-purposes an existing course only after first experimenting with technology in the traditional classroom.Ê Instructional

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technology in the college classroom is used almost exclusively to augment the classroom lecture.Ê The first instructional application attempted by a professor is usually a PowerPoint presentation, a progression that is almost routine.

**Synchronous and Asynchronous Delivery Systems**

Synchronous Delivery.Ê The technologies used in synchronous delivery include two-way interactive video telecourses, one-way video with two-way audio, audioconferencing, and audiographic conferencing, and may include electronic white boards, radio, television, IITS, closed-circuit, satellite.Ê Not only are the production systems more complex and expensive, but the number of potential students is limited by the real-time requirement for class attendance. In effect, this is a variation of traditional classroom instruction rather than a replacement.ÊÊ In most respects, the classroom structure and routines are similar to a conventional classroom, with the instructor treating persons at remote sites as if they are members of a large class in a lecture hall. In fact, other than using presentation graphics, instructors do not act much differently than in a conventional classroom. Students on-site or at a remote site are expected to listen, take notes, and answer questions.

Asynchronous Delivery.Ê In the asynchronous method of distance education, the instructor and students are not required to have real-time contact on a regular basis. It is not time and location dependent.Ê In some cases students are mailed videotapes or CD-ROMs, when the content could be put on the web, and this drives up costs due to production and post-production costs, personnel to handle the mailing of products, and other expenses. However, the WBI course that avoids videotape and CD-ROM development enables students access to any remote resource at the students' convenience, or on demand.Ê There is no need to have full-motion video for an entire class, especially if computer software and learning activities are designed for students to preclude the need for lecture.Ê Asynchronous WBI is much less expensive and equally effective as the more expensive synchronous models and traditional classroom instruction.

To determine a break-even point an administrator can calculate development costs and plot the projected income necessary to recover costs (i.e., **cost** - the sum of ***fixed*** and ***variable*** expenses, and **price** (per unit/enrollment).ÊÊ A general formula for calculating break-even

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| **Fixed CostsÊ**<br>**1 - (Variable cost per unit/Selling Price per unit)** | **=ÊÊ Revenue to Break-Even** |

IHEs often do not account for many fixed items in a budget on a daily or hourly basis, such as office equipment, utilities, office space, and so forth.Ê Variable costs are often easier to track because they may be hourly wages paid to specialists, contracting for online delivery, new software or equipment for production, and so forth.Ê Factors that contribute to variable costs can be identified in this table (rented and/or owned):

Some costs, particularly for faculty time, can be considered a redistribution rather than additional costs.Ê Changing a faculty member's role temporarily to develop courses for WBI may raise costs for the short-term, because of the need for someone else to teach certain existing

courses in the faculty member's absence, but these costs can be recovered in the long-term as the income per professor increases.

If development costs for a web-based course are less than a synchronous course, and if student outcomes are essentially the same, the IHE administrator needs to consider developing web-based courses and avoid more expensive synchronous endeavors.Ê However, the one factor that can drive up such expenses are online delivery systems for WBI.Ê Some IHE's provide their own management systems with varying degrees of comprehensiveness.Ê Examples of efforts by institutions without significant commercial vendor support include the University of Virginia, Iowa State University, Florida State University, and Penn State University.ÊÊÊ

**Commercial Comprehensive Delivery Applications**

The following commercial vendors are in alphabetical order, either by name of the product or service or by the name of the company, whichever is most prominent in the literature.Ê Some of the vendors provide aids to develop courses, others offer various tools for synchronous courses, and some offer comprehensive services including management for the IHE.Ê Costs are not discussed because it is almost impossible to determine due to the menu of services and different costs associated with scalability and number of users.ÊÊ Furthermore, there is no intention to evaluate these products or to suggest that one product is better than another, a determination best made by potential clients.Ê Finally, some products were excluded from consideration because they are specifically designed for corporate training or do not appear to have the necessary components to circumvent the greatest obstacle, namely the inability of instructors to create web content.

**Blackboard.** (http://www.blackboard.com/) Blackboard Inc. provides Blackboard, "CourseInfo" and "Campus" for hosting their own courses for individual courses, multiple course sites, and academic intranets, respectively.Ê Blackboard allows instructors to point and click to incorporate learning materials from word processing, audio and video, and presentation files. At the high end, with "Campus," the services include a comprehensive management system and the software becomes a campus portal for all distance courses and a variety of related services: business and strategic planning, content conversion and course migration , instructional design , systems integration and project management, application integration, training and education, web hosting, and maintenance and support.

**Collegis.** (http://www.collegis.com/) Services can range from implementing web-based courses into the curriculum through support services to incorporating campus-wide "Administrative Technology Services" such as new student, finance, to providing comprehensive Network Infrastructure Services such as planning and developing technology migration strategies.Ê Collegis advertises its product by stating that personnel will be assigned to the campus to work with faculty in the development of course content and other aspects of development, delivery, and maintenance of a distance education system.

**Complete On-Line Teaching System or COLTS.Ê**
(http://www.corgisoft.com/public/colts/index.html) COLTS uses form-based tools to create classroom homepages.Ê An instructor can input text or paste from word processing then convert the text to HTML code.Ê The instructor can create or edit seminars, quizzes, and exams through a library structure.Ê Also included is a "Student Journal Module" to allow an instructor and student to work together on a document.

**Convene.** (http://www.convene.com/) Convene develops partnerships with IHE's and provides a six-week training program for instructors.Ê Convene also offers a host server and network, technical support, and other services.

**Creator.** (http://www.melbourneit.com.au/creator) Universities, schools and corporate trainers can use "Creator" to create online learning environments with interactive elements including video/audio-conferencing, newsgroups and chat sessions.

**eCollegeÊ** (http://www.ecollege.com/student/index.html) eCollege is a recent project created by Real Audio/Real Video to offer partnerships with IHE's to build online courses.Ê In the Premium program the IHE receives course development, instructional design, student orientation, virtual campus development, hardware and software as a complete "turn-key solution" for distance education.Ê The eCollege page is prominent on the IHE home page and serves as the portal for distance education connection.

**e-Education.** (http://www.e-education.com/software.html) Instructors can use a set of tools to create courses or in the full service plan.Ê An IHE may simply provide course content in an electronic format and e-education will create a course.Ê In the "self-service option" the instructor creates the course content.Ê Course elements include a course builder, announcements, roster, TestMaker, and forum administration.

**Embanet.** (http://www.embanet.com/) Courses can be created with an online wizard, including tests and other features.Ê The company claims that courses can be operational in two months if instructors develop the content, or in a matter of days if the company makes the course.Ê The best known courses of Embanet are those operated through the UCLA extension service.

**MadDuck Technologies** (http://www.madduck.com/) This company provides three major products: Web Course in a Box, Web Campus in a Box, and Web CourseBuilder ToolBox.Ê "Web Course in a Box" provides for development of a syllabus, calendar and/or scheduler, announcements, personal web pages, forums, lessons, tests, a whiteboard, and chat.Ê The "Campus" tool supports building lists of instructors, students, announcements, active courses, inactive and archived courses and home pages for instructors and students.Ê The "Faculty" tool supports home page, forum development, and campus lists of courses.

**SocratEase.** (http://www.SocratEase.com/school.htm) Primarily for corporate training but also used by universities, SocratEase incorporates a course management, testing and test tracking, built-in e-mail communication for discussion and questions, and a course authoring tool.

**WBT Systems.** (http://www.west.ie/) The company provides "TopClass," which is a comprehensive system including course development, quizzes, discussion, and other features of web-based courses. Sections from one course can be imported into other courses. "TopClass Assistants" enables Microsoft Office 97 documents to be converted automatically into courses.Ê "TopClass Creator" instructors "authorized by TopClass Server" have access to web tools for assembling complete courses from any "web-compatible" content.Ê Other tools can render presentations or documents into courses.

**WebCT** (http://www.webct.com) Tools include a conferencing system, chat, student progress tracking, group project organization, student self-evaluation, grade maintenance and distribution, access control, navigation tools, auto-marked quizzes, electronic mail, automatic index generation, course calendar, student homepages, course content searches and much more.

**Evaluation of Online Delivery Applications**

Comparisons or evaluations may be found at ZDNet (http://cma.zdnet.com/) and The British Columbia Standing Committee (http://www.ctt.bc.ca/landonline/choices.html) conducts its own evaluations and also includes links to reviews online.Ê Comparisons are difficult because of the differences in features and the variety of services available.Ê Products can be evaluated in terms of technical aspects, support, training, cost, and many other features that can be of variable importance to different IHE's.Ê For institutions that outsource everything, only cost and services are important.Ê For those interested in providing a mechanism forÊ inexperienced instructors to develop course content, the nature of the development tools and continued support or management features may be more important.Ê Some programs emphasize tests and test management, which may be unimportant to some and critical for others.Ê In general, the following areas are used in developing evaluation criteria:
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- Circumvention of HTML to develop course material
- Password and username security
- Desktop based file management
- Flexibility for instructors to revise and manage course content
- Test banks (development, randomization, timed, scoring, reporting, feedback options, etc.)
- Feedback on tutorial questions
- Progress tracking for instructor and student
- Electronic Mail
- Bulletin board

- Chat facility
- Logged chat
- Application sharing
- Asynchronous sharing
- Synchronous sharing
- File exchange
- Newsgroups
- Whiteboard
- Virtual space
- Videoconferencing
- E-commerce (registration, fee payments, enrollment, and so forth)
- Technical issues (numerous and often unique to each site)

**Conclusion**

As many IHE's consider the need to develop distance education because of student demand and competition, outsourcing or contracting with a private vendor is an option many consider.Ê As indicated in this article, there are several options. Whether or not an IHE develops its own system or contracts for the services, the more difficult issues are resistance by segments of the faculty to distance education, faculty intellectual property fights, workload, training and technical support, faculty support, and job security.Ê These are important concerns for any administrator or faculty.Ê The WWW threatens to widen the gap between rich and poor, between North and South, and perhaps between IHE's that thrive and those that go out of business. While the paper does not permit room for comparative data, anyone requesting information from the authors will receive information promptly.
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